definitely to such a location. The persistency of the hemianopsia could be more satisfactorily explained by a vascular condition than any other pathological process, and possibly of the type exemplified in angio-neurotic edema.

That the occasional permanency of scotoma in migraine has received recognition and must not be lost sight of in handling our cases, can best be stated by quoting from Dr. Herbert Moffitt's paper, "Clinical Observations on Migraine," which was read before this section in 1911.

"The transient visual phenomena of migraine may occasionally be followed by permanent lesions. Noyes has recorded a case of persistent hemianopsia succeeding ephemeral attacks many times repeated, softening of the cuneus being found at autopsy. Uhthoff has seen three instances of permanent hemianopsia follow upon migraine scotomata. The French school has particularly emphasized the danger of ophthalmic migraine and described varied sequelæ; as permanent aphasia, hemiplegia, hemianopsia and amaurosis."

I am satisfied that a carefully taken history of our headache cases will support the view that migraine is much more prevalent than is suspected. A typical case, of course, is quickly recognized, but the abortive type and the ones with some of the classical symptoms absent are just as important.

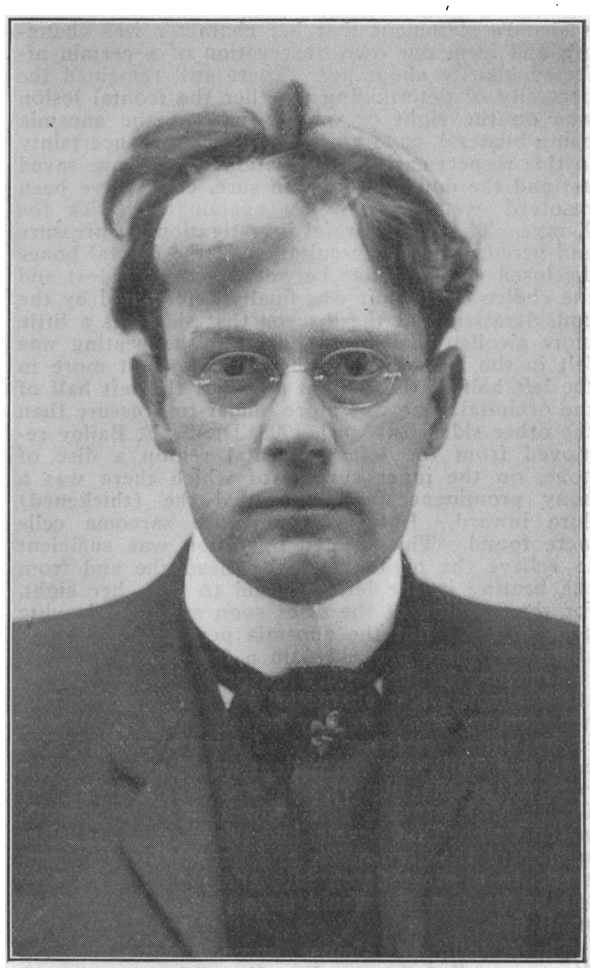
Investigation of such cases should not end with refraction, but should go on to a determination of the efficiency of the organs of internal secretion and excretion, as well as the questions of nutrition and habit in their broad sense. These patients should also be made to realize that, while their symptoms seem to point to local conditions exclusively, the real cause is generally widespread and often very obscure, requiring a long and painstaking search to discover.

FOUR CASES OF REMOVAL OF A PREFRONTAL TUMOR OF THE BRAIN.

By L. NEWMARK, M. D., San Francisco.

Nowhere else in the brain are the conditions so favorable for the removal of a tumor without disturbance of function as in the neighborhood of the anterior pole of the hemisphere. Despite a tendency to associate intellectual activity with the forebrain, a tendency which seems to derive strength from some cases of frontal tumor which simulated paretic dementia so closely that they were altogether misinterpreted, operative interference in this region entails no mental deterioration. The motor and sensory centers are too distant to be affected, and the foot of the third frontal convolution is also remote enough to escape damage which might cause aphasia.

This negative circumstance, however, which renders manipulation in the prefrontal area, other things being equal, less detrimental than elsewhere in the brain, implies a certain difficulty in diagnosis, namely, that which arises from the absence of unambiguous focal symptoms. The mental changes exhibited in variation of character, or dementia, or the famous "moria" of Jastrowitz, a more or less fatuous jocularity, are not commonly very definite, and their significance as a focal symptom is still debateable. But a *pressure symptom*, the diminution of the sense of *smell,* is very valuable as a guide to the recognition of prefrontal tumors, not only of those situated at the base immediately superjacent to the olfactory bulbs and tracts, but also of those arising near the convex surface of the brain or from the dura covering it, and hence easier of access for the surgeon. Still, since it must take time for the tumor to grow sufficiently to exert pressure at a distance, the dependence on the anosmia will deprive us of the advantage of early diagnosis. How such a delay may imperil the patient's sight, if not his life, will be illustrated in the fourth case.



In all four cases the tumor was removed. Two patients are alive; one died a few hours after the operation, but could have been saved had she been seen earlier, before the growth had attained its great size; and the life of the fourth was prolonged about two years, death being inevitable on account of the malignancy of the disease. In every instance the histological examination was made by Professor Ophüls, of Stanford University.

Case 1. Endothelioma of inner table of the skull and outer surface of the dura mater. Operation by Dr. Harry M. Sherman. This case has been reported with many details in the Journal of the American Medical Association of April 22, 1911. It is recapitulated here because it belongs to the

group and because this is an opportunity to bring the history to date.

The patient, a woman of 38 years of age, had suffered from paroxysms of headache since May, 1906. In the interval she appeared to be well. In November, 1907, choked discs had first been observed. When first examined by me in March, 1908, there was, besides the choked discs, complete bilateral anosmia. A tremor of the upper and lower extremities on both sides attracted attention. The headaches were chiefly occipital, and the pain extended into the back of the neck and, on one occasion, as far downward as the upper dorsal region. There had occurred sharp clonic contractions of the muscles that retracted the head. A beating deep in, or behind, the left ear was complained of. Despite these symptoms, which for a time riveted our attention to the occipital region, the anosmia was more readily explained by a frontal disease: a localization which gained some slight support from her husband's statement that her character was changing and from our own observation of a certain affected hilarity about her. There still remained the necessity of determining whether the frontal lesion was on the right or on the left, as the anosmia being bilateral, gave no clew. From the uncertainty in this respect earlier observation would have saved us; and the doubt, I now am sure, could have been resolved even then by an examination with the X-rays. The most careful investigation by pressure and percussion and auscultation of the frontal bones disclosed no difference between the two sides; and the choice of the left was finally determined by the consideration that the disc on that side was a little more swollen than the other, that the beating was felt in the left ear, that the pain was felt more in the left half of the occiput and that the left half of the occipital bone was more tender to pressure than the other side. In April, 1908, Dr. T. E. Bailey removed from the left prefrontal region a disc of bone, on the inner surface of which there was a bony prominence which pressed the (thickened) dura inward. In this excrescence sarcoma cells were found. This limited operation was sufficient to relieve the patient from all headache and from the beating in the left ear, and to save her sight, for the swelling of the discs soon subsided, leaving good vision. But the anosmia persisted; and, furthermore, there protruded in a few weeks through the opening in the skull a tumor which jutted over the eyebrow. Her character was still perverse and her memory was stated by herself and her husband to be quite untrustworthy. It was not until December 5, 1910, that the patient would submit to the removal of the tumor; this was accomplished by Dr. H. M. Sherman. The growth, an endothelioma, which weighed 140 grams, had arisen from the outer surface of the dura mater and impressed this membrane to a great depth into the brain; the cavity left by its removal would have readily contained a small fist.

There followed almost immediately what Dr. Sherman called "a complete dispositional reversal."

In our publication of this case Dr. Sherman expressed the fear that more bone might have to be removed, wherefore he postponed the closure of the defect in the skull, which he intended to accomplish by means of a silver plate.

As a supplement to this history, and, I hope, its complement, I may now add that the silver plate has been inserted, with excellent cosmetic effect, and that when the patient was last seen, not long ago, she was ruddy, very fat, and perfectly comfortable.

In the next case the anosmia was also bilateral when the patient came under our observation, but the sensitiveness of the bone and the order in which the eyes became affected helped in determining the hemisphere, and the X-ray corroborated the conclusion.

Case 2. Angiosarcoma (perithelioma) of the dura mater. Operation by Professor Stanley Stillman.

Mrs. T., aged 21 years, came to us May 14, 1913. She had begun to suffer about nine months before from headaches and attacks of blindness. At first the headaches were frontal, only now and then felt in the back of the head; but since the birth of a child, four months before, they were felt over the right eye and in the eyeball itself. The sense of smell had vanished altogether about three weeks ago.

A doctor in Oregon wrote that a Wassermann test had given a positive result, wherefore she had been very liberally treated there with iodide of potash and mercury and two injections of neosalvarsan.

A Wassermann test made in this city turned out negative.

We found complete bilateral anosmia and choked discs. Examination by Dr. Green at the Lane Hospital on May 17 showed further that perception of light by the left eye was lost, that vision with the right was 15/15-, and that the field was very much contracted, being limited to the neighborhood of the fixing point, and tubular.

The frontal bone was tender to pressure on the left and this together with the greater impairment of vision in the eye of that side made the localization of the tumor in the left hemisphere reasonably certain. Some misgiving, however, was caused by the pain in, and over, the right eyeball, by the impression of several observers that there was a slight right exophthalmos, by a slight, but constant, increase of the left radius reflex when compared with the right, and by a loss of the left abdominal reflex while the right was present—symptoms which, if allowed full weight, would point rather to the right frontal lobe.

But Dr. Boardman's fine X-ray picture set the doubts aside by showing a bony projection from the inner table of the left frontal bone. There were no mental changes of any kind. No aphasia, no agraphia, no tremor.

On May 19, 1913, Dr. Stillman made an osteoplastic flap in the left prefrontal region. The gouging through the hyperostosis on the inner table, the circumvention of which was impossible on account of the proximity of the longitudinal sinus, was attended with considerable hemorrhage. The dura did not pulsate. It was infiltrated; the mesial portion of the exposed membrane was very hard. Some of the thickened bone was removed. Hereupon the patient's bad condition necessitated suspension of the operation.

When the osteoplastic flap was turned down on May 24, the dura was seen to pulsate and to bulge. The dura having been opened, a tumor attached to its inner surface was easily enucleated. The cavity which remained after the removal of the tumor bled but little. The brain seemed to be rather compressed than infiltrated, the line of cleavage was clean and did not bleed a great deal.

After the first stage the patient's hemoglobin declined rapidly; it was 48% at the time of the second stage; by May 28 it had fallen to 20%. It subsequently rose quickly and the patient could be discharged from the hospital on June 12 with the last remnants of a fistula from which cerebrospinal fluid had issued for 12 days.

The patient became quite blind immediately after the operation; but she regained a little vision in the right eye and when discharged had 8/200. The swelling of the discs had subsided.

The piece of thickened skull consisted mainly of normal bone, but on its inner surface cells were found which Dr. Ophüls took to be tumor. The growth itself was about 3½ inches wide and one inch thick, and weighed 72 grams. It was an angi-

osarcoma (perithelioma) of the dura mater. In all pieces of the dura which had been excised tumor was found microscopically.

Had this patient come under observation earlier no doubt her sight could have been preserved. The positive Wassermann, seeming to require specific treatment, is probably responsible for the waste of valuable time. The malignancy of the tumor makes us fear a recurrence.

In the following case, unlike the two foregoing, the anosmia was unilateral when the patient presented herself, although she came late in the disease; had she come a few days later, we should have been confronted with bilateral loss of the sense of smell. But here again the order in which the eyes were affected, and the sensitiveness of the frontal bone, would have rendered the localization comparatively easy. Like the Wassermann test in the second case, the urinary examination furnished a stumbling-block in this case; the presence of a trace of albumen with casts seems to have diverted attention from the brain. An earlier diagnosis could surely have saved the patient's vision, and probably her life.

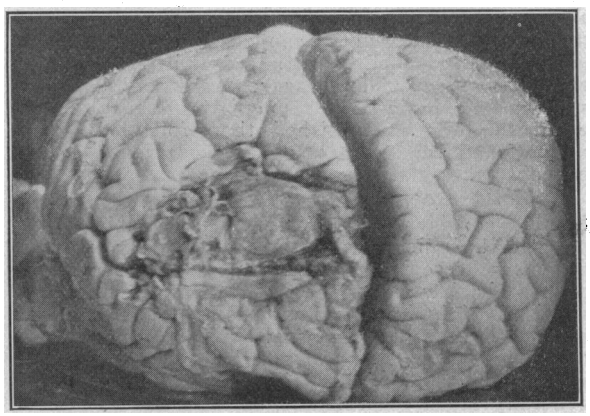
Case 3. Gliosarcoma of left prefrontal lobe. Removed by Professor Rixford.

Mrs. R., age 30 years, was blind when we first saw her on June 21, 1911. Her blindness was caused by optic atrophy which had followed upon choked discs. From one oculist the information was derived that in March, 1910, there had been optic neuritis, far more advanced in the left eye than in the right; from another source we learned that exactly one year to the day before we saw her the disc were white; the right one "filled in," and the vision in that eye nearly 20/20, while the left was sharply defined and associated with only sufficient visual power to enable her to distinguish fingers at one foot. There was a report dated from the same period that in the urine there was a trace of albumin with many hyalin, granular and waxy casts.

By the patient herself we were told that she had always been subject to headaches, which had increased but little since her eyes had grown bad. The severest pain was now felt over the left eye. In the last six months she had been dizzy at times and would stagger when dizzy. No fault was found with her memory. She thought her sense of smell was unimpaired.

But the first examination immediately disclosed complete anosmia at the left nostril, while she could detect and distinguish odors very well at the right. She was examined every day with regard to her olfactory sense, with the same result until June 30, when we found uncertainty in recognizing the odor of substances held under the right nostril; the next morning there was total loss of the sense of smell. The left half of the skull was tender to pressure, but this tenderness was particularly distinct in the left prefrontal region. There thus concurred in indicating the side of the lesion (and its frontal site) the priority of the olfactory and the visual loss on the left and the tenderness to pressure in the left prefrontal region of the skull. There were no other symptoms. The urine was now normal, Wassermann in the blood negative. Of the existence of frontal ataxia, which might be presumed from the mention of dizziness and staggering, we could not convince ourselves. The patient's disposition was placid and cheerful, which, she said when questioned on the subject, was habitual with her.

There was no hope of restoring her vision, but we were justified in attempting to save her life. Accordingly Dr. Rixford was requested to operate in the left prefrontal region. On July 5, 1911, he removed the bone in this area. There was profuse hemorrhage from the diploe. The dura pulsated, but it was rough and evidently affected by the tumor. On account of the loss of blood the opening of the dura had to be postponed. The operation was not resumed until 10 days later. The tumor was then shelled out entire, after which a large cavity was left in the frontal lobe. Not more than fifteen minutes was required for this second stage. About two hours after the conclusion of the operation, the patient seemed in good condition, but in less than another hour she suddenly expired. An autopsy was not permitted. The tumor was a gliosarcoma. It weighed 187 grams.



At what period of the disease the power of smelling was first affected could not be ascertained in any of the cases described in the foregoing. The loss of this function on one side does not obtrude itself upon the notice of the patient; when the anosmia is bilateral an affection of the sense of *taste* is likely to be complained of, but it is only the perception of flavors that is disordered. The only one of the group who consulted us before even unilateral anosmia had occurred, was the patient in the concluding case. He presented no tenderness of the skull at any particular point, nor was there a preponderance of visual disturbance on one side; the localization in this instance was long in suspense.

Case 4. Angiosarcoma of right prefrontal area. Removal of original tumor, and two operations for recurrence, by Professor Stanley Stillman.

When on December 19, 1910 Dr. Kaspar Pischel introduced to us G. S., a man age 31 years, from whose choked discs he inferred the presence of a cerebral tumor, a careful examination revealed no other departure from the normal except absence of the left Achilles reflex. Headache was very slight and was felt in the back of the head. Repeated examination by ourselves and by a succession of other doctors failed to furnish any indication of the situation of the tumor. On January 19, 1911, we caused particles of cerebral substance to be aspirated from the right temporal lobe through a small trephine-opening; these were examined histologically by Professor Ophüls and declared to contain no tumor cells. While the result of this exploration did not eliminate the temporal lobe altogether from consideration it made us rather persistent in watching for symptoms of frontal disease. We were duly apprehensive of the effects of protracting observation too long before interfering to relieve the pressure; but were reluctant to operate merely for decompression as long as there was time to await developments which might lead to a radical operation. When vomiting began in February, the patient's family were not easily convinced that the trouble was not abdominal. The headaches became very severe in

the course of that month; they were referred chiefly to the base of the skull and were associated with a feeling of constriction of the throat which made the patient seize his larynx at the height of the paroxysm and hold his breath until he became cyanosed. At last, feeling that it would be imprudent to delay longer, we determined to perform the ordinary temporal operation for decompression, and, encountering now no opposition, we agreed on March 13, 1911, as the time for intervention. But on March 12, re-testing once again the sense of smell we found anosmia at the right nostril. Accordingly, on the following morning a large flap was turned down in the right fronto-temporal region, and at the anterior part of the opening the dura was observed to pulsate less forcibly than elsewhere. The dura having been opened, a dark red infiltrating tumor came into view. This was removed together with surrounding brain-tissue; upon the incision, with which this was accomplished, there followed a gush of fluid and the operator's finger entered a cavity, probably the dilated ventricle.

After the operation the patient's visual power suffered a considerable decline. He was able to report at the office twelve days after the operation; his discs were still greatly choked. But in the course of a few weeks the swelling of the discs subsided, his sight improved very much, and there was no complaint about his visual acuity during the rest of his life. The sense of smell also returned. He attended to his business with great zeal, exhibiting generally much good-humor, such as was natural to him, and striving to bear philosophically the knowledge of the malignant character and the import of his disease. From time to time it was reported that his mind was not sound; there were rumors that he was displaying the exuberance of "paresis"; his wife related that he was changing mentally, but she could not convince us that there was anything more than an occasional fit of impatience or irritability very pardonable in one whose prospects were so desperate. To none of the medical men who attended him did he ever appear of unsound mind (except when he became delirious under the influence of narcotics). In July, 1911, he had a convulsive seizure, whereupon he was given bromide, to the use of which his exemption from further attacks for a whole year may be ascribed. After that period had elapsed, he suffered a series of more than seventeen convulsions in a single night, from which he emerged, however, apparently none the worse. Meanwhile a tumor had reappeared in the opening in the skull; it pulsated freely. Papillitis and headaches having recurred Dr. Stillman again removed the tumor October 1, 1912.

The papillitis disappeared, and in comfort the patient went about his affairs for several months. It was not long, however, before new nodules formed at the site of operation, despite the treatment with the X-ray, which had been sedulously applied ever since the first operation. In February, 1913, a fluctuating protuberance through the defect in the skull was punctured and 70 CC of turbid and discolored cerebrospinal fluid withdrawn. Herewith began the last stage of the disease. The fluid accumulated very rapidly, its tension became greater, the discomfort increased, the patient vomited, had headaches and flashes of blindness, and his discs began to choke again. The relief afforded by the punctures became briefer and briefer, as time went on, so that the patient demanded them more frequently, finally three a day. The photograph (Fig. 1) shows the protrusion on April 3, 1913. The tappings having become ineffectual, the patient's distress impelled us to a last palliative operation, and on May 15 a mass the size of a large lime was removed, besides smaller tumor-nodules from the flap. There was an immediate benefit from this; the swelling of the optic discs again receded, the headache and the vomiting ceased and the patient declared he felt "fine". But after 10 days of comfort all the symptoms returned. The protrusion through the opening in the skull increased to several times the size of that shown in the photograph, and necessitated frequent tappings with the escape of ever larger amounts of fluid, until a maximum of 485 CC at a single sitting was reached. In the last 30 days of his life, which ended July 14, 1913, the quantity of fluid thus obtained amounted to 5173 CC!

Figure 2 shows the situation of the growth in the brain. This illustration will serve also to indicate the position of the tumors in the other members of this group, as Figure 1 indicates their site with relation to the skull. The proximity to the median line explains the production of bilateral loss of smell by a single tumor. The neoplasm in the last case penetrated into the anterior horn and extended far into the lateral ventricle, pushing away the corpus callosum and the internal capsule without invading them.

The following items of diagnostic importance may be gathered from this group of cases:

(1). The loss of the sense of smell may be of very great use in localizing the disease in the prefrontal area. I find that some textbooks do not make this clear; they mention this disturbance rather as resulting from a lesion of the uncinate gyrus of the temporal lobe; Oppenheim, moreover, states that he has repeatedly observed the occurrence of unilateral or bilateral anosmia associated with tumors of the cerebellum, resulting from the pressure of the base of the brain upon the olfactory nerve. Had this statement been allowed to prevail in the cogitations upon the situation of the tumor in the first case, it must have misled us into seeking the growth in the posterior fossa.

(2). Three of the cases supply confirmation of the assertion that in frontal tumors it is the eye on the side of the tumor that is likely to be affected the earlier and the more severely.

(3). The X-ray picture may conduce to certainty in localization by revealing a circumscribed hyperostosis over the tumor.

(4). Circumscribed tenderness of the skull to pressure or percussion may be a valuable localizing sign.

(5). Whatever a positive Wassermann may mean, it does not necessarily mean that the patient's cerebral disease is cerebral syphilis.

THE DIFFERENTIAL DIAGNOSIS OF PALMAR SYPHILIS, ECZEMA AND PSORIASIS.*

By DOUGLASS W. MONTGOMERY, M. D., and GEORGE D. CULVER, M. D., San Francisco.

The symptoms of syphilis, eczema or psoriasis of the palms are often so perplexing that a differentiation is not always possible, and yet a positive diagnosis is here particularly important, not alone because of the necessity of the hand in daily work, but also because these diseases in this situation are so liable to be refractory that the moral support of certainty is eminently desirable as tending to hold the physician to a correct line of treatment.

Since the fire of 1906 there are records in our office of one hundred and two of these cases, of

* Read before the Forty-third Annual Meeting of the Medical Society, State of California, Oakland, April, 1913.